

CLAIMS

We claim:

1. A molding compound comprising
 - ♦ a reinforcing fiber having average fiber length of 6 mm or greater;
 - ♦ a non-fibrous filler; and
 - ♦ an unsaturated polyester resin comprising an unsaturated monomer and a polymer, the polymer comprising a hydroxyl component and a carboxylic component,

wherein the hydroxyl component comprises a monomeric diol or triol and a polymeric polyol, wherein the polymeric polyol has a number average molecular weight of 200 to 4000, and is selected from the group consisting of polyether diols, polyether triols, polyester polyols and combinations thereof, and the carboxylic component comprises at least one compound selected from the group consisting of unsaturated carboxylic diacids, unsaturated carboxylic anhydrides, unsaturated carboxylic diesters, and mixtures thereof,

wherein the polymeric polyol is present at a level of 1 to 30 weight percent, based on the total weight of the hydroxyl component and the carboxylic component.

2. A molding compound according to Claim 1, wherein the polymeric polyol comprises polyether diol or poly triol with number average molecular weight of 200 to 2000.

3. A molding compound according to Claim 1, wherein the polymeric polyol comprises a polyester polyol.

4. A molding compound according to Claim 1, wherein the polymeric polyol comprises polypropylene oxide.

5. A molding composition according to Claim 1, wherein the polymeric polyol comprises polyethylene oxide.

6. A molding composition according to Claim 1, wherein the polymeric polyol comprises polytetramethylene glycol.

7. A molding compound according to Claim 1, wherein the polymeric polyol comprises polycaprolactone.

8. A molding compound according to Claim 1, wherein the polymeric polyol is present at a level of 1 to 20 weight percent, based on the total weight of the hydroxyl component and the carboxylic component.

9. A molding compound according to Claim 1, wherein the monomeric diol comprises one or more compounds selected from the group consisting of propylene glycol, ethylene glycol, 1,2-butane diol, 1,4-butane diol, and combinations thereof.

10. A molding compound according to Claim 1, wherein the reinforcing fiber comprises glass fibers.

11. A molding compound according to Claim 1, wherein the non-fibrous filler is selected from the group consisting of calcium carbonate, alumnina, clay, mica, wollastonite, silicate, wood flour, and mixtures thereof .

12. A molding compound according to Claim 11, wherein the non-fibrous filler comprises calcium carbonate.

13. A molding compound according to Claim 1, further comprising up to 7% by weight based on the weight of the entire molding compound, of a second fiber having fibers of average length less than or equal to 4 millimeters.

14. A molding compound according to Claim 13, wherein the second fiber is selected from the group consisting of glass fibers, carbon fibers, cellulose fibers, aramid fibers, textile fibers, SMC regring, and nylon fibers.

15. A molding compound according to Claim 13, wherein the second fiber comprises carbon fibers.

16. A molding compound according to Claim 13, wherein the second fiber comprises SMC regrind.

17. A molding compound according to Claim 13, wherein the second fiber comprises glass fibers.

18. A molding compound according to Claim 1, wherein the reinforcing fiber comprises glass fibers having an average length of greater than 10 millimeters.

19. A molded article prepared by compression molding a molding compound according to Claim 1.

20. A process for producing a molded thermoset article comprising the steps of

providing a molding compound comprising:

- ◆ a reinforcing fiber having average fiber length of 6 mm or greater;
- ◆ a non-fibrous filler; and
- ◆ an unsaturated polyester resin comprising an unsaturated monomer and a polymer, the polymer comprising a hydroxyl component and a carboxylic component,

wherein the hydroxyl component comprises a monomeric diol or triol and a polymeric polyol, wherein the polymeric polyol has a number average molecular weight of 200 to 4000, and is selected from the group consisting of polyether diols, polyether triols, polyester polyols and combinations thereof, the carboxylic component comprises at least one compound selected from the group consisting of unsaturated carboxylic diacids, unsaturated carboxylic anhydrides, unsaturated carboxylic diesters, and mixtures thereof, and wherein the polymeric polyol is present at a level of 1 to 30 weight percent, based on the total weight of the hydroxyl component and the carboxylic component; and

applying heat and pressure to the molding compound for a time sufficient to cure the article.

21. A process according to Claim 20, wherein the polymeric polyol comprises polypropylene oxide.

22. A method according to Claim 20, wherein the polymeric polyol comprises polyethylene oxide.

23. A method according to Claim 20, wherein the polymeric polyol comprises polytetramethylene glycol.

24. A method according to Claim 20, wherein the polymeric polyol comprises polycaprolactone.

25. A method according to Claim 20, wherein the polymeric polyol is present at a level of 1 to 20 weight percent, based on the total weight of the hydroxyl component and the carboxylic component.

26. A method according to Claim 20, wherein the molding compound further comprises up to 7% by weight based on the weight of the entire molding compound of a second fiber having fibers of average length less than or equal to 4 millimeters.

27. A method for making a reinforced thermoset article comprising the steps of

- ◆ placing a fiberglass mat over a mold;
- ◆ impregnating the mat with an unsaturated polyester resin, and
- ◆ applying heat and pressure to the mold for a time sufficient to effect cure,

wherein the unsaturated polyester resin comprises an unsaturated monomer and a polymer, the polymer comprising a hydroxyl component and an unsaturated carboxylic component, the hydroxyl component comprising a monomeric diol or triol and a polymeric polyol,

wherein the polymeric polyol has a number average molecular weight of 200 to 4000, and is selected from the group consisting of polyether diols, polyether triols, polyester polyols and combinations thereof, and

the carboxylic component comprises at least one compound selected from the group consisting of unsaturated carboxylic diacids, unsaturated carboxylic anhydrides, unsaturated carboxylic diesters, and mixtures thereof.

28. A method according to Claim 27, wherein the polymeric polyol is present at a level of 1 to 30 weight percent, based on the total weight of the diol component and the carboxylic component.

29. A method according to Claim 27, wherein the polymeric polyol comprises a polyether diol or polyether triol, or a mixture thereof.

30. A method according to Claim 27, wherein the polymeric polyol comprises a polyester polyol.

31. A pultrusion process comprising the steps of

- ◆ providing continuous strands of reinforcing fiber;
- ◆ impregnating the strands with an unsaturated polyester resin; and
- ◆ applying heat and pressure to the impregnated strand for a time sufficient to effect cure;

wherein the unsaturated polyester comprises an unsaturated monomer and a polymer, the polymer comprising a hydroxyl component and a carboxylic component, the hydroxyl component comprising a monomeric diol or triol and a polymeric polyol,

wherein the polymeric polyol has a number average molecular weight of 200 to 4000, and is selected from the group consisting of polyether diols, polyether triols, polyester polyols and combinations thereof, and the carboxylic component comprises at least one compound selected from the group consisting of unsaturated carboxylic diacids, unsaturated carboxylic anhydrides, unsaturated carboxylic diesters, and mixtures thereof.

32. A process according to Claim 31, wherein the polymeric polyol is present at a level of 1 to 30 weight percent, based on the total weight of the hydroxyl component and the carboxylic component.

33. A process according to Claim 31, wherein the polymeric polyol comprises a polyether diol or polyether triol, or a mixture thereof.

34. A process according to Claim 31, wherein the polymeric polyol comprises a polyester polyol.